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 US Patents Full-Text Database
 US OCR Full-Text Database
 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
 IBM Technical Disclosure Bulletins

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<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=AND</i>			
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<u>L8</u>	L1 and (supercritical carbon dioxide)	83	<u>L8</u>
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Search Results - Record(s) 11 through 17 of 17 returned.

☐ 11. Document ID: US 6596454 B2

Using default format because multiple data bases are involved.

L9: Entry 11 of 17

File: USPT

Jul 22, 2003

US-PAT-NO: 6596454

DOCUMENT-IDENTIFIER: US 6596454 B2

TITLE: Toner and manufacturing method thereof

DATE-ISSUED: July 22, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Adachi; Katsumi	Nara			JP
Sakuma; Masamitsu	Hirakata			JP
Toizumi; Kiyoshi	Nara			JP
Kamimura; Taisuke	Kitakatsuragi-gun			JP
Iwamatsu; Tadashi	Nara			JP
Mishima; Kenji	Fukuoka			JP

US-CL-CURRENT: 430/137.18; 430/137.1

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. De
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☐ 12. Document ID: US 6406718 B1

L9: Entry 12 of 17

File: USPT

Jun 18, 2002

US-PAT-NO: 6406718

DOCUMENT-IDENTIFIER: US 6406718 B1

TITLE: Orthorhombic crystalline form of fluticasone propionate and pharmaceutical compositions thereof

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWC	Draw. De
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☐ 13. Document ID: US 6299906 B1

L9: Entry 13 of 17

File: USPT

Oct 9, 2001

US-PAT-NO: 6299906

DOCUMENT-IDENTIFIER: US 6299906 B1

**** See image for Certificate of Correction ****

TITLE: Process for making submicron particles

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstract	Claims	KWIC	Drawings
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☐ 14. Document ID: US 6063138 A

L9: Entry 14 of 17

File: USPT

May 16, 2000

US-PAT-NO: 6063138

DOCUMENT-IDENTIFIER: US 6063138 A

TITLE: Method and apparatus for the formation of particles

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstract	Claims	KWIC	Drawings
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☐ 15. Document ID: US 5851453 A

L9: Entry 15 of 17

File: USPT

Dec 22, 1998

US-PAT-NO: 5851453

DOCUMENT-IDENTIFIER: US 5851453 A

**** See image for Certificate of Correction ****

TITLE: Method and apparatus for the formation of particles

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstract	Claims	KWIC	Drawings
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☐ 16. Document ID: US 5795594 A

L9: Entry 16 of 17

File: USPT

Aug 18, 1998

US-PAT-NO: 5795594

DOCUMENT-IDENTIFIER: US 5795594 A

TITLE: Salmeterol xinafoate with controlled particle size

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstract	Claims	KWIC	Drawings
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☐ 17. Document ID: US 3228849 A

L9: Entry 17 of 17

File: USOC

Jan 11, 1966

US-PAT-NO: 3228849

DOCUMENT-IDENTIFIER: US 3228849 A

TITLE: Utilization of nuclear fission for chemical reactions

DATE-ISSUED: January 11, 1966

INVENTOR-NAME: FELLOWS ALBERT T

US-CL-CURRENT: 376/323; 12/128C, 204/157.15, 204/157.4, 204/157.44, 204/157.46,
204/157.5, 204/157.6, 204/157.63, 204/157.87, 204/157.9, 204/157.93, 204/157.99,
204/158.14, 204/900, 204/904, 204/905, 376/212, 376/213, 376/324, 376/325, 376/402,
376/411, 376/421, 376/901, 976/DIG.139, 976/DIG.318, 976/DIG.42, 976/DIG.43,
976/DIG.57, 976/DIG.97, 976/DIG.98

Full	Title	Citation	Front	Review	Classification	Date	Reference				Claims	KWC	Draw. De
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Search Results - Record(s) 1 through 10 of 17 returned.

☐ 1. Document ID: US 20030194953 A1**Using default format because multiple data bases are involved.**

L9: Entry 1 of 17

File: PGPB

Oct 16, 2003

PGPUB-DOCUMENT-NUMBER: 20030194953

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030194953 A1

TITLE: Methods, apparatus and slurries for chemical mechanical planarization

PUBLICATION-DATE: October 16, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
McClain, James B.	Raleigh	NC	US	
DeSimone, Joseph M.	Chapel Hill	NC	US	

US-CL-CURRENT: 451/41

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 2. Document ID: US 20030031784 A1

L9: Entry 2 of 17

File: PGPB

Feb 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030031784

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030031784 A1

TITLE: Method for collecting and encapsulating fine particles

PUBLICATION-DATE: February 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Perrut, Michel	Nancy		FR	

US-CL-CURRENT: 427/212; 118/400, 427/213.3

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 3. Document ID: US 20020189454 A1

L9: Entry 3 of 17

File: PGPB

Dec 19, 2002

PGPUB-DOCUMENT-NUMBER: 20020189454
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020189454 A1

TITLE: Method for capturing fine particles by percolation in a bed of granules

PUBLICATION-DATE: December 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Perrut, Michel	Nancy		FR	

US-CL-CURRENT: 95/274; 55/512

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw. De
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☐ 4. Document ID: US 20020073511 A1

L9: Entry 4 of 17

File: PGPB

Jun 20, 2002

PGPUB-DOCUMENT-NUMBER: 20020073511
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020073511 A1

TITLE: Method and apparatus for the formation of particles

PUBLICATION-DATE: June 20, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hanna, Mazen H.	Bradford		GB	
York, Peter	Ilkley		GB	

US-CL-CURRENT: 23/295R; 127/31, 423/659

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw. De
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☐ 5. Document ID: US 20020055323 A1

L9: Entry 5 of 17

File: PGPB

May 9, 2002

PGPUB-DOCUMENT-NUMBER: 20020055323
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020055323 A1

TITLE: Methods, apparatus and slurries for chemical mechanical planarization

PUBLICATION-DATE: May 9, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
McClain, James B.	Raleigh	NC	US	
DeSimone, Joseph M.	Chapel Hill	NC	US	

US-CL-CURRENT: 451/41

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 6. Document ID: US 20020045347 A1

L9: Entry 6 of 17

File: PGPB

Apr 18, 2002

PGPUB-DOCUMENT-NUMBER: 20020045347

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020045347 A1

TITLE: Divided pressure vessel apparatus for carbon dioxide based systems and methods of using same

PUBLICATION-DATE: April 18, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Worm, Steven L.	Raleigh	NC	US	
DeYoung, James P.	Durham	NC	US	
McClain, James B.	Raleigh	NC	US	
Brainard, David E.	Wake Forest	NC	US	

US-CL-CURRENT: 438/689

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 7. Document ID: US 20020010982 A1

L9: Entry 7 of 17

File: PGPB

Jan 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020010982

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020010982 A1

TITLE: METHOD AND APPARATUS FOR THE FORMATION OF PARTICLES

PUBLICATION-DATE: January 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
HANNA, MAZAN	ALLERTON		GB	
YORK, PETER	ILKLEY		GB	

US-CL-CURRENT: 23/300; 23/295R, 423/659

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 8. Document ID: US 20010055561 A1

L9: Entry 8 of 17

File: PGPB

Dec 27, 2001

PGPUB-DOCUMENT-NUMBER: 20010055561
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010055561 A1

TITLE: Material processing by repeated solvent expansion-contraction

PUBLICATION-DATE: December 27, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Saim, Said	New Milford	CT	US	
Horhota, Stephen	Brookfield	CT	US	
Bochniak, David Joseph	Ridgefield	CT	US	

US-CL-CURRENT: 423/658.5

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 9. Document ID: US 20010036586 A1

L9: Entry 9 of 17

File: PGPB

Nov 1, 2001

PGPUB-DOCUMENT-NUMBER: 20010036586
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010036586 A1

TITLE: Toner and manufacturing method thereof

PUBLICATION-DATE: November 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Adachi, Katsumi	Nara-shi		JP	
Sakuma, Masamitsu	Hirakata-shi		JP	
Toizumi, Kiyoshi	Nara-shi		JP	
Kamimura, Taisuke	Kitakatsuragi-gun		JP	
Iwamatsu, Tadashi	Nara-shi		JP	

US-CL-CURRENT: [430/110.1](#); [430/137.1](#), [430/137.18](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 10. Document ID: US 6623355 B2

L9: Entry 10 of 17

File: USPT

Sep 23, 2003

US-PAT-NO: 6623355

DOCUMENT-IDENTIFIER: US 6623355 B2

TITLE: Methods, apparatus and slurries for chemical mechanical planarization

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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1	512	(427/213).CCLS.	USPAT; US-PGPUB	2004/03/16 11:47
2	205	(264/7).CCLS.	USPAT; US-PGPUB	2004/03/16 11:49
3	280	(564/192).CCLS.	USPAT; US-PGPUB	2004/03/16 11:49

L Number	Hits	Search Text	DB	Time stamp
1	1083	(210/768,774).CCLS.	USPAT; US-PGPUB	2004/03/16 12:04

process); PROC (Process); USES (Uses)
(**supercrit.**, **solvent**; in **coating** of fine
particles in circulating fluidized beds by rapid **expansion** of
supercrit. solns.)

RN 124-38-9 HCAPLUS
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 25 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1996:616340 HCAPLUS
DN 125:277764
TI Studying Activity Coefficients of Probe **Solutes** in Selected
Liquid Polymer **Coatings** Using Solid Phase Microextraction
AU Zhang, Zhouyao; Pawliszyn, Janusz
CS Department of Chemistry, University of Waterloo, Waterloo, ON, N2L 3G1,
Can.
SO Journal of Physical Chemistry (1996), 100(44), 17648-17654
CODEN: JPCHAX; ISSN: 0022-3654
PB American Chemical Society
DT Journal
LA English
AB The study of **solute**-polymeric liquid **solvent** interaction
contributes to the understanding of the fundamental principles of
chromatog. since liquid polymers are often used as stationary phases in
gas chromatog. (GC) and high-performance liquid chromatog. (HPLC).
The knowledge of how a polymeric stationary phase interacts with different
types of compds. helps researchers to select and synthesize the right
phase for successful separation of mixts. in a time-efficient manner. The
development of a simple, cost effective, and time-efficient method for
studying **solute-solvent** interaction can aid
significantly the ever-**expanding** applications of chromatog. In
this work, a new approach, solid phase microextn. (SPME), is used for
investigations of activity coeffs. of the McReynolds probe **solutes**
in selected liquid polymers. The probe **solutes** are absorbed by an
immobilized liquid polymer phase **coated** on the outside surface of
a fused silica fiber, and quantitated by a GC technique using a com.
available GC column. The research in this study shows that activity
coeffs. measured by SPME are equivalent to those by the commonly used GC
method. This new method eliminates the need to prepare a GC column using
the polymer of interest as in the GC method and, thus, significantly
simplifies the whole measuring process. It also allows convenient
investigation of the prepared **coating** by other surface and
spectroscopic techniques.

L97 ANSWER 26 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1996:122671 HCAPLUS
DN 124:274772
TI **Crystallization** of phenanthrene from toluene with **carbon**
dioxide by the **GAS** process
AU Berends, Edwin M.; Bruinsma, Odolf S. L.; de Graauw, Jan; van Rosmalen,
Gerda M.
CS Lab. Process Equipment, Delft Univ. Technol., Delft, 2628 CA, Neth.
SO AICHE Journal (1996), 42(2), 431-9
CODEN: AICEAC; ISSN: 0001-1541
PB American Institute of Chemical Engineers
DT Journal
LA English
AB The **crystallization** of phenanthrene from toluene with CO2 as
the **antisolvent gas** is described. In the **GAS**

process, a pressurized **gas** is dissolved into a liquid **solvent**, where it causes a volumetric **expansion** and lowers the solubility of the **solute**. Theor. models are presented for the liquid-phase **expansion** and the solubility as a function of pressure and temperature. The Nyvlt theory for batch **crystallization** is adapted to predict the pressure profile in the **crystallizer** needed to maintain a constant supersatn. and growth rate. Generation of seeds is accomplished via a pressure pulse at the saturation pressure. The average particle

size of the phenanthrene could be varied from 160 to 540 μm . Creation of seeds doubles the particle size and reduces the coefficient of variation significantly. The residual amount of toluene in the **crystals** without treatment is .apprx.70 ppm. The particles are agglomerates of phenanthrene **crystals**.

IT 124-38-9, Carbon dioxide, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (**crystallization** of phenanthrene from toluene by **gas**
antisolvent process using)

RN 124-38-9 HCAPLUS

CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 27 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1996:4915 HCAPLUS

DN 124:156296

TI An exact lattice model of complex solutions: chemical potentials depend on **solute** and **solvent** shape

AU Krukowski, Anton E.; Chan, Hue Sun; Dill, Ken A.

CS Dep. Pharmaceutical Chem., Univ. California San Francisco, San Francisco, CA, 94143-1204, USA

SO Journal of Chemical Physics (1995), 103(24), 10675-88

CODEN: JCPSA6; ISSN: 0021-9606

PB American Institute of Physics

DT Journal

LA English

AB For the theor. modeling of phys. transformations such as boiling, freezing, glassification, or mixing, it is necessary to know how the partition function of a system depends on its d. Many current treatments rely either on low d. **expansions** or they apply to very simple and sym. mol. shapes, like spheres or rods. Here the authors develop an exact anal. lattice theory of materials and mixts. that applies to arbitrarily complex mol. shapes over the full range of densities from **gas** to **crystal**. The approach is to compute partition functions for small nos. of shapes and to explore the dependence on d. by varying the volume of the system. Recently a question has been raised about whether entropies of dissoln. are better treated using classical solvation theories or Flory-Huggins theory. The authors explore this for a range of mol. sizes and shapes, from lattice squares and cubes, to rods, polymers, crosses, and other shapes. Beyond low densities, the entropic component of the chemical potential depends on shape due to the different degrees to which mols. "interfere" with each other. It was found that neither Flory-Huggins nor classical solvation theories is correct for all shapes. Mols. that are "articulated" are remarkably well treated by Flory-Huggins theory, over all densities, but globular mols. are qual. and quant. different, and are better treated by the classical chemical potential, consistent with expts. of Shinoda and Hildebrand. These results confirm that the Flory-Huggins theory differs from classical theory not because of mol. size differences per se; it accounts for the coupling between translations and conformational steric interference.

L97 ANSWER 28 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1995:26711 HCAPLUS

DN 122:107766

TI **Solute** deposition in a porous polymer matrix from rapid **expansion** of a **supercritical** solution

AU Bertuccio, A.; Guarise, G. B.; Pallado, P.; Corain, B.

CS Istituto di Impianti Chimici, Universita di Padova, Padua, 35131, Italy

SO Chemical and Biochemical Engineering Quarterly (1994), 8(1), 11-16

CODEN: CBEQEZ; ISSN: 0352-9568

DT Journal

LA English

AB The rapid **expansion** of a **supercrit.** solution in a porous polymer matrix is carried out to obtain the deposition of the **solute** inside the structure. The sudden pressure reduction results in a strong supersatn., so that the formation of small solid particles can be achieved. The deposition of ferrocene **crystallites** on poly(N,N-dimethylacrylamide) is studied using **CO2** at temps. between 323-353 K and pressures from 18 to 22 MPa. A math. model is developed to represent the **expansion** of a real **gas** through the exit nozzle. Simulated and exptl. profiles for pressure and temperature are in agreement, so that the amount of **precipitated solute** and the phys. state of the **solvent** can be predicted.

→ L97 ANSWER 29 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1994:587124 HCAPLUS

DN 121:187124

TI **Precipitation** of poly(L-lactic acid) and composite poly(L-lactic acid)-pyrene particles by rapid **expansion** of **supercritical** solutions

AU Tom, Jean W.; Debenedetti, Pablo G.; Jerome, Robert

CS Dep. Chem. Eng., Princeton Univ., Princeton, NJ, 08544, USA

SO Journal of Supercritical Fluids (1994), 7(1), 9-29

CODEN: JSFLEH; ISSN: 0896-8446

DT Journal

LA English

AB The rapid **expansion** of **supercrit.** solns. (RESS) was explored as a novel route to the formation of microparticles and microspheres useful in controlled drug delivery applications. Poly(L-lactic acid) was dissolved in **supercrit. CO2** with **CHClF2** as a **cosolvent** and **precipitated** by RESS. The polymers solubility and its mol. weight in solution were found to depend on processing time because of sample polydispersity. The morphol. of the **precipitate** (microparticles, microspheres, agglomerates, or dendrites) was examined as a function of the type of the **expansion** device (orifices or capillaries), pre-**expansion** temperature, and **solvent** composition. Dendrites were the most common morphol. when using orifices. Microspheres formation using capillaries occurred with low pre-**expansion** temps. and low length-to-diameter ratio. A one-dimensional fluid mech. model of the **solvent's expansion** in a capillary indicates that microspheres were formed preferentially when the fluid's exit d. was high, suggesting that substantial **precipitation** occurred outside the capillary. In the first comprehensive study of the effects of process conditions on the composite powders formed by RESS copptn., pyrene (a nonpolymeric fluorescent **solute**) was copptd. with poly(L-lactic acid) from **supercrit. CO2-CHClF2** solns. Fluorescence and transmission microscopy allowed the observation of pyrene in the coppt. These expts. showed clearly the uniform incorporation of pyrene microparticles within polymer microspheres, and thus, the feasibility of RESS as a technique for the copptn. of composite particles with multiple substances.

IT 124-38-9, Carbon dioxide, properties

RL: PRP (Properties)

(solvent; composite particles for controlled drug release
copptn. by rapid **expansion** of **supercrit.** solns.)

RN 124-38-9 HCAPLUS
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 30 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1994:194464 HCAPLUS
DN 120:194464
TI Relative supersaturation ratio and separation factor in
crystallization with high pressure CO2
AU Chang, Chiehming J.; Liou, Yuchung; Lan, Wen Jen
CS Dep. Chem. Eng., Natl. Chung-Hsing Univ., Taichung, 400, Taiwan
SO Canadian Journal of Chemical Engineering (1994), 72(1), 56-63
CODEN: CJCEA7; ISSN: 0008-4034
DT Journal
LA English
AB **Crystallization** in the presence of high-pressure **gas** as
antisolvent could be applied for the recovery of valuable compds.
from liquid solution A study of separation behavior is presented here for a
mixture
of anthracene and anthraquinone in cyclohexanone **expanded** with a
gaseous antisolvent, CO2. The pressure range
was 0.1-12 MPa; the temperature was either 292 or 313 K. Separation factors
were
obtained from the measured salted-out yields and the supersatn. of each
solute could be also obtained for this pressure-tuning
crystallization The separation factor varied almost linearly with relative
supersatn. ratio in the **crystallization** of anthracene-anthraquinone from
cyclohexanone and CO2.
IT 124-38-9, Carbon dioxide, uses
RL: USES (Uses)
(in pressure-induced **crystallization** of anthracene and anthraquinone
from cyclohexanone)
RN 124-38-9 HCAPLUS
CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 31 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
AN 1994:94354 HCAPLUS
DN 120:94354
TI Sample introduction in capillary **supercritical** fluid
chromatography using sequential density gradient focusing and
solvent venting
AU Liu, Zaiyou; Farnsworth, Paul B.; Lee, Milton L.
CS Dep. Chem., Brigham Young Univ., Provo, UT, 84602, USA
SO Journal of Microcolumn Separations (1991), 3(5), 435-42
CODEN: JMSEJ; ISSN: 1040-7685
DT Journal
LA English
AB A technique was developed for large volume sample introduction in capillary
supercrit. fluid chromatog. A 20-cm length of 200-µm i.d.
capillary tubing was used as precolumn. The precolumn temperature could be
easily controlled by passing an elec. current through an elec. conductive
paint **coated** on its outer surface. During injection, the same

solvent was vented from the precolumn with **CO2** (**gas**) at 32 atm, while the precolumn was kept at room temperature. **Solutes** were transferred onto the head of the anal. column as a narrow band by d. gradient focusing, which was established with (a) a temperature gradient along the precolumn, (b) a rapid **expansion** of **CO2** from **supercrit.** fluid to **gas**, and (c) a temperature difference between the precolumn and the anal. column. This injection approach minimized **solute** mass discrimination and could be easily performed.

→ L97 ANSWER 32 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1994:33310 HCAPLUS
 DN 120:33310
 TI Purification of polycyclic aromatic compounds using salting-out separation in high-pressure **carbon dioxide**
 AU Chang, Chiehming J.; Liou, Yuchung
 CS Dep. Chem. Eng., Yuan Ze Inst. Technol., Taoyuan, 320, Taiwan
 SO Journal of Chemical Engineering of Japan (1993), 26(5), 517-22
 CODEN: JCEJQA; ISSN: 0021-9592
 DT Journal
 LA English
 AB **Gas antisolvent crystallization** has the potential for application in the recovery of valuable compds. from solution, and in the separation of solid-solid mixts. Exptl. data are presented for a mixture of anthracene and anthraquinone dissolved in cyclohexanone which was **expanded** by a **gaseous antisolvent, CO2**. The pressure range is 0.1-12 MPa, and the temperature 291-313 K. The relation of salted-out yield and normalized feed concentration gives an important parameter, the min. solubility, from which supersatn. can be defined for **gas antisolvent crystallization**. Effects of initial feed concns. of solid **solutes**, temperature, and pressure on the separation of anthracene and anthraquinone have also been studied.
 IT 124-38-9, **Carbon dioxide**, uses
 RL: USES (Uses)
 (high-pressure, **crystallization** of polycyclic aromatic compds. using)
 RN 124-38-9 HCAPLUS
 CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 33 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1993:452405 HCAPLUS
 DN 119:52405
 TI Manufacture of **coated** fine particles, especially, lanthanum oxide-**coated** silica particles
 IN Kitagawa, Kazuo; Yamamoto, Seiichi; Moritoki, Masato
 PA Kobe Steel Ltd, Japan
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05057166	A2	19930309	JP 1991-246861	19910831
PRAI	JP 1991-246861		19910831		

AB The process comprises dissoln. of a 1st **solute** (e.g., SiO₂) and 2nd **solute** (e.g., La₂O₃) in 1st and 2nd **solvents** (e.g., both water) to form 1st and 2nd systems at **supercrit.** or

antisolvents causing limited process capacity. The different mechanisms of **precipitation** depend on whether the **antisolvent** is a compressed, **supercrit.**, or liquefied **gas**.

→ L97 ANSWER 23 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1997:7897 HCAPLUS
 DN 126:62342
 TI Microparticle formation of HMX by **supercritical carbon dioxide antisolvent recrystallization**
 AU Cai, Jianguo; Sun, Zhaohui; Ma, Hongxi; Liao, Xiaochun; Zhou, Zhanyun
 CS Chem. Eng. Res. Center, ECU ST, Shanghai, 200237, Peop. Rep. China
 SO Huadong Ligong Daxue Xuebao (1996), 22(5), 512-517
 CODEN: HLI XEV
 PB Huadong Ligong Daxue Xuebao Bianjibu
 DT Journal
 LA Chinese
 AB The **recrystn.** ratio of 1, 3, 5, 7-tetranitro-1, 3, 5, 7-tetraazacyclooctane (HMX) in acetone, cyclohexanone, and dimethylsulfoxide solution using **supercrit. carbon dioxide antisolvent (GAS)** was compared. By using **GAS** process in acetone solution, microparticles of β -HMX within 2 .apprx. 13 μ m can be obtained. Effects of pressure, temperature, initial feed concentration of HMX **solute**, **expansion** speed of solution and growth of **crystal** on the **GAS** process have been studied. Under all exptl. pressures of 8.0 .apprx. 12.0 MPa tested, lower test temperature and lower concentration of feed solution were preferable for obtaining β -HMX and microparticles.
 IT 124-38-9, **Carbon dioxide**, uses
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (microparticle formation of HMX by **supercrit. carbon dioxide antisolvent recrystn.**)
 RN 124-38-9 HCAPLUS
 CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

L97 ANSWER 24 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN
 AN 1996:711759 HCAPLUS
 DN 125:332821
 TI Fine particle **coating** in a circulating fluidized bed by rapid **expansion of supercritical** fluid solutions
 AU Tsutsumi, Atsushi; Nakata, Mitsutoshi; Mineo, Tomoko; Yoshida, Kunio
 CS Dep. Chem. System Engineering, Univ. Tokyo, Tokyo, 113, Japan
 SO Kagaku Kogaku Ronbunshu (1996), 22(6), 1379-1383
 CODEN: KKRBAW; ISSN: 0386-216X
 PB Kagaku Kogaku Kyokai
 DT Journal
 LA Japanese
 AB Fine particle **coating** by rapid **expansion of supercrit. CO2** solns. of paraffins was performed in a circulating fluidized bed (50 mm i.d.) with an internal nozzle at the center of the riser. Microspheroidal catalyst particles (average particle size 56 μ m) were used as the core particles. The **coating** mass and **coating** rates were measured by a sampling method. The effects of **gas** flow rate and **solute** concentration on **coating** rate and **coating** efficiency were examined
 IT 124-38-9, **Carbon dioxide**, processes
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

AU 9881182 A1 19990104 AU 1998-81182 19980619

EP 991455 A1 20000412 EP 1998-930901 19980619

R: BE, CH, DE, ES, FR, GB, IT, LI, NL

JP 2002505617 T2 20020219 JP 1999-503993 19980619

PRAI GB 1997-12945 A 19970620

GB 1997-17344 A 19970816

WO 1998-GB1800 W 19980619

AB A process is disclosed for **precipitation** of a **solute** from a Dense Fluid **Solvent**. A solution of the **solute** in a Dense Fluid **Solvent** is **expanded** under conditions such that the Dense Fluid **Solvent** passes from the Dense Fluid **Solvent** region of its phase diagram into a 2-phase region of its phase diagram to cause **precipitation** of the **solute** from the solution Apparatus for performing the process is also disclosed.

RETABLe

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
British Nuclear Fuels P	1996			EP 0692289 A	HCAPLUS
Hewlett Packard Co	1990			EP 0384969 A	HCAPLUS
Jacques, L	1991			US 5011819 A	HCAPLUS
Moses, J	1988			US 4770780 A	HCAPLUS
Richard, S	1988			US 4734451 A	HCAPLUS

L97 ANSWER 20 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1998:686542 HCAPLUS

DN 129:262158

TI Fractional **crystallization** by **gas antisolvent** technique: theory and experiments

AU Bertuccio, Alberto; Lora, Michele; Kikic, Ireneo

CS Istituto di Impianti Chimici, Universita di Padova, Padova PD, I-35131, Italy

SO AIChE Journal (1998), 44(10), 2149-2158

CODEN: AICEAC; ISSN: 0001-1541

PB American Institute of Chemical Engineers

DT Journal

LA English

AB The efficacy of **CO2** as an **antisolvent** was studied exptl. for the **precipitation** of naphthalene and phenanthrene from their solns. in toluene at 298 and 310 K. Phenanthrene was salted out of solution at every condition investigated, whereas naphthalene was never segregated as a solid phase. These behaviors are explained by a model representing the composition of the phases and supersatn. of the solution as functions of pressure. Based on results from ternary systems, expts. were performed with the quaternary system **CO2** -toluene-naphthalene-phenanthrene: starting from an equimolar solution of the two solids in toluene, phenanthrene with a purity higher than 98.5% can be collected in the **precipitation** cell, while naphthalene with .apprx.13% of phenanthrene is recovered from the liquid phase after **expansion**. The simulation of the process was able to account for the exptl. evidence. Although the **solutes** used do not have a practical application, a general method is outlined to exploit the possibility of using the **supercrit. antisolvent** technique for separation

IT 124-38-9, Carbon dioxide, uses

RL: NUU (Other use, unclassified); USES (Uses)

(fractional crystallization by gas antisolvent technique)

RN 124-38-9 HCAPLUS

CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Catchpole, O	1996			Proc Int Symp on Hig	
Chang, C	1994	72	56	Can J Chem Eng	HCAPLUS
Dixon, D	1991	37	1441	AIChE J	HCAPLUS
Foster, N	1997			Proc 4th Int Symp on	
Gallagher, P	1989			Supercritical Fluid	
Hong, S	1992	74	133	Fluid Phase Equil	HCAPLUS
Kikic, I	1997	36	5507	Ind Eng Chem Res	HCAPLUS
Kikic, I	1997			Proc Int Symp on Sup	
Liang, M	1994			Proc Int Symp on Sup	
Liu, G	1996	35	4626	Ind Eng Chem Res	HCAPLUS
McHugh, M	1993			Supercritical Fluid	
Nagahama, K	1997			Proc Int Symp on Sup	
Shishikura, A	1994	42	1993	J Agric Food Chem	HCAPLUS
Shishikura, A	1992	5	303	J Supercrit Fluids	HCAPLUS
Shishikura, A	1991			Proc Int Symp on Sup	
Yeo, S	1993	41	341	Biotechnol and Bioen	HCAPLUS

L97 ANSWER 21 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1998:7381 HCAPLUS

DN 128:116698

TI **Supercritical crystallization:** designed
crystallization? Rapid **expansion** of
supercritical solutions (RESS) and **gas**
antisolvent (GAS) and principal applications

AU Sanz Pastor, A. I.; Cocero, Alonso, M. J.

CS Dpto. Ingenieria Quimica, Universidad de Valladolid, Spain

SO Ingenieria Quimica (Madrid) (1997), 29(339), 183-190

CODEN: INQUDI; ISSN: 0210-2064

PB Ingenieria Quimica, S.A.

DT Journal; General Review

LA Spanish

AB The review, with 36 refs., covers methods of **supercrit. fluid crystallization** and discusses their possible uses in the pharmaceutical and polymer industries. **Supercrit. crystallization** methods can produce products with redefined particle sizes, narrow size distribution, absence of **solvent** occlusions, and residence times of seconds. In the RESS process (rapid **expansion** of **supercrit. solns.**), a **solute** dissolved in a **supercrit. fluid ppts.** to produce a sharp reduction in pressure and a following decline in solubility The **GAS (gas antisolvent)** process uses a pressurized **gas**, under critical or quasi-critical (pressure and temperature close to the critical point) conditions, soluble in organic **solvent** and insol. in the **solute**, such that dissoln. provokes a volumetric **expansion** which reduces the solubility of the **solute**; the **supercrit. fluid** acts as an **antisolvent**, causing **precipitation** of **solute**.

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
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is used as **antisolvent** for the **solute** initially solubilized in a conventional **solvent**. Upon mixing by adding compressed **carbon dioxide** to the initial solution in a vessel, the solution is **expanded**, thus reducing its **solvent** power, and the **solute ppts.** Numerous exptl. investigations have proved the attractiveness of these processes in terms of product quality; however, the understanding of their fundamentals and of the effects of individual process parameters is still very limited. The development of applications of the **GAS recrystn.** technol. requires that the gap between exptl. evidence and theor. understanding is filled.

IT 124-38-9, **Carbon dioxide**, uses
 RL: NUU (Other use, unclassified); USES (Uses)
 (supercrit.; in gas antisolvent
 recrystn. of specialty chems.)
 RN 124-38-9 HCAPLUS
 CN Carbon dioxide (8CI, 9CI) (CA INDEX NAME)

O=C=O

RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Alessi, P	1996	35	4718	Ind Eng Chem Res	HCAPLUS
Aniedobe, N	1997	30	2792	Macromol	HCAPLUS
Beckmann, W	1997	69	349	Chem Ing Tech	HCAPLUS
Benedetti, L	1997	53	232	Biotechnol Bioeng	HCAPLUS
Berends, E	1996	42	431	AIChE J	HCAPLUS
Bertuccio, A	1998	44	2149	AIChE J	HCAPLUS
Bodmeier, R	1995	12	1211	Pharm Res	HCAPLUS
Bungert, B	1997	139	349	Fluid Phase Equilibr	HCAPLUS
Bungert, B	1998	37	3208	Ind Eng Chem Res	HCAPLUS
Catchpole, O	1996	12	309	Process Technology P	HCAPLUS
Chang, C	1989	35	1876	AIChE J	HCAPLUS
Chang, C	1990	36	939	AIChE J	HCAPLUS
Chang, C	1991	7	275	Biotechnol Progress	HCAPLUS
Chang, C	1994	72	56	Can J Chem Eng	HCAPLUS
Chang, C	1993	26	517	J Chem Eng Japan	HCAPLUS
Debenedetti, P	1990	36	1289	AIChE J	HCAPLUS
Debenedetti, P	1993	82	311	Fluid Phase Equilibr	HCAPLUS
Debenedetti, P	1993	24	27	J Controlled Rel	HCAPLUS
Dixon, D	1991	37	1441	AIChE J	HCAPLUS
Dixon, D	1993	39	127	AIChE J	HCAPLUS
Dixon, D	1993	50	1929	J Appl Polymer Sci	HCAPLUS
Domingo, C	1996	166	989	J Cryst Growth	HCAPLUS
Domingo, C	1997	10	39	J Supercrit Fluids	HCAPLUS
Falk, R	1997	44	77	J Controlled Rel	HCAPLUS
Falk, R	1998	15	1233	Pharm Res	HCAPLUS
Furuta, S	1995	148	197	J Cryst Growth	HCAPLUS
Gallagher, P	1989	406	334	ACS Symp Ser	HCAPLUS
Gallagher, P	1991	284	96	AIChE Symp Ser	HCAPLUS
Gallagher, P	1992	5	130	J Supercrit Fluids	HCAPLUS
Griscik, G	1995	155	112	J Cryst Growth	HCAPLUS
Gromov, D	1998	108	4647	J Chem Phys	HCAPLUS
Gupta, P	1991	17	129	J Controlled Rel	HCAPLUS
Jianguo, C	1996	4	257	Chin J Chem Eng	HCAPLUS
Kikic, I	1997	36	5507	Ind Eng Chem Res	HCAPLUS
Kim, J	1996	12	650	Biotechnol Progress	HCAPLUS
Kitamura, M	1997	178	378	J Cryst Growth	HCAPLUS
Knutson, B	1996	77	89	Drugs and the pharma	HCAPLUS

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RETABLE

Referenced Author (RAU)	Year (RPY)	VOL (RVL)	PG (RPG)	Referenced Work (RWK)	Referenced File
Bertucco, A	1998	44	2149	AIChE J	HCAPLUS
Bungert, B	1997	69	298	Chem Ing Tech	HCAPLUS
Bungert, B	1998	37	3208	Ind Eng Chem Res	HCAPLUS
Chang, C	1991	7	275	Biotechnol Prog	HCAPLUS
Chang, C	1994	72	56	Can J Chem Eng	HCAPLUS
Chang, C	1995	40	850	J Chem Eng Data	HCAPLUS
Chang, C	1993	26	517	J Chem Eng Jpn	HCAPLUS
Dixon, D	1991	37	1441	AIChE J	HCAPLUS
Foster, N	1997		27	The 4th Internationa	
Gallagher, P	1989	406	334	ACS Symposium Series	HCAPLUS
Griffith, A	1999	38	411	Polym Plast Technol	HCAPLUS
Jianguo, C	1996	4	257	Chin J Chem Eng	
Kordikowski, A	1995	8	205	J Supercrit Fluids	HCAPLUS
Liou, Y	1992	27	1277	Sep Sci Technol	HCAPLUS
Regtop, H	1990			WO 9014337	HCAPLUS
Regtop, H	1994			US 5310936	HCAPLUS
Regtop, H	1995			US 5466824	HCAPLUS
Reverchon, E	1999	15	1	J Supercrit Fluids	HCAPLUS
Savage, P	1995	41	1723	AIChE J	HCAPLUS
Shishikura, A	1994	42	1993	J Agric Food Chem	HCAPLUS
Shishikura, A	1997		51	The 4th Internationa	
Sorenson, R	1989			Progress in Medicina	
Subramaniam, B	1986	25	1	Ind Eng Chem Process	HCAPLUS
Tai, C	1998	44	989	AIChE J	HCAPLUS
Thiering, R	2000	75	29	J Chem Technol Biote	HCAPLUS
Weder, J	1999	38	1736	Inorg Chem	HCAPLUS

L97 ANSWER 18 OF 44 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 1999:698745 HCAPLUS

DN 132:266692

TI **Gas antisolvent recrystallization of specialty chemicals**

AU Muhrer, Gerhard; Mazzotti, Marco

CS Institut fur Verfahrenstechnik, ETH Zurich, Zurich, CH-8092, Switz.

SO International Symposium on Industrial Crystallization, 14th, Cambridge, United Kingdom, Sept. 12-16, 1999 (1999), 330-339 Publisher: Institution of Chemical Engineers, Rugby, UK.
CODEN: 68IRAJ

DT Conference; General Review; (computer optical disk)

LA English

AB A review with 84 refs. The need for the manufacturing of micron or sub-micron particles with narrow size distributions is gaining more and more importance in the production of specialty chems. and pharmaceuticals. In the last case microparticles are often intended for controlled drug release applications. There is therefore an increasing interest in developing technologies which, contrary to conventional techniques, allow microparticles with controlled particle size distribution and product quality to be produced under mild and inert conditions. **Supercrit** fluid technol., particularly when using **carbon dioxide**, offers promising possibilities for tackling this challenge, e.g., through the Rapid **Expansion of Supercrit. Solns.**, **Precipitation with Compressed Antisolvent**, and **GAS (Gas Anti-Solvent)** techniques. In particular, **GAS recrystn.** exploits the low solubility of pharmaceutical compds. in **supercrit. carbon dioxide**, which